

## REMARKS

Claims 1 - 23 remain active in this application. The specification has been reviewed and editorial revisions made where seen to be appropriate. Claims 1 and 18 have been amended to improve clarity and form. Support for the amendments of the claims is found throughout the application, particularly at page 12, lines 30 - 31 and in Figure 2 and the description thereof on pages 15 - 18 of the specification as originally filed. A typographical revision has been made in claim 7. No new matter has been introduced into the application.

Claims 1 - 11 and 14 - 23 have been rejected under 35 U.S.C. §103 as being unpatentable over Ortel in view of Mori et al. and claims 12 - 13 have been rejected under 35 U.S.C. §103 as being unpatentable over Ortel in view of Mori et al. and Cheng. These grounds of rejection are respectfully traversed, particularly since the Examiner clearly does not make a *prima facie* demonstration of obviousness of any claim in the application.

The Examiner admits that Ortel does not teach or suggest three of the five elements of claim 1 and relies on Mori et al. for the same; dismissing method claims 18 - 23 by reference to the discussion of the apparatus claims. However, the Examiner does not appear to recognize that the systems of Ortel and Mori et al. are quite different from each other (or that both are very different from the invention) and fails to demonstrate motivation for the combination or modification proposed or even that the result would be operative for any useful purpose, much less to produce or even lead to an expectation of success in providing the meritorious effects of the invention. Moreover, the Examiner has failed to consider the recited relationships between the claimed elements and has, in

essence, considered the invention as simply the use of time multiplexed tone signalling in any condition monitoring system for any type of communication system.

The system of Ortel is a fault detection system for a broadband network which transmits a pilot tone from a central station and detects whether or not it is received at subscriber interface equipment. If the pilot tone is received, a signal is returned in the upstream direction to so indicate so that the location of the fault can be determined in a network of the topological configuration shown in Figure 5 thereof by consideration of the subscriber stations or locations from which the upstream signalling is not received. The system of Ortel relies on a telecommunication infrastructure to identify the subscriber station(s) reporting the fault and does not appear to provide continuous monitoring but relies on the central station detecting an off-hook condition with no corresponding routing/DTMF signal, the latter apparently provided by the "M" path. In other words, the system of Ortel responds to the absence of upstream signalling to indicate a fault and it is faults in the line rather than faults in the subscriber station which are monitored and detected.

Mori et al. appears to use tone signalling but, like Ortel, is directed to a telecommunications system and relies on use of a "pair of time-sharing communications highways" connecting a plurality of ports in a time-sharing manner. As summarized at column 1, lines 31 - 55, a test signal is sent to subscriber stations in a time-sharing manner over a first communication highway and transferred to the second communication highway (with some intermediate coding and decoding at the port under test) by which it is returned in a similarly time sharing manner. Thus, it is a central station which individually tests or interrogates the ports in a time-sharing manner and

establishes the time slots during which the respective communications will occur in each of the communications highways for respective ports. It is believed important to note, from column 1, lines 37 - 40, that the first step of the testing in accordance with Mori et al. is to detect the ports which "can transfer input signals from the first communication highway to the second one" and transferring an input signal to at least one of the port circuits so detected. The system of Mori et al. also relies on testing of ports only when in the idle state as noted in the paragraph bridging columns 7 and 8 and the different time slots disclosed are directed to different pairs of communications highways.

In sharp contrast, the invention, as claimed, is directed to detection of a condition at a subscriber station in a manner which provides continuous monitoring of an extremely large number of subscribers with periodic communication of acceptably short cycle over a network which principally is intended for continuous broadband downstream signalling (with potentially long signal propagation times) with which upstream signalling must not interfere even when performing upstream communication over the same communication link with the broadband downstream signalling. Such interference can be avoided in accordance with the invention because the invention permits (but does not necessarily require) narrow band tone signalling using a low frequency carrier. More importantly, the invention is simplified so that sufficient data can be provided and processed with a minimal amount of hardware that is commercially available at an economically acceptable cost such as subsets of telephone set circuits and printers of low complexity. These advantages of the invention are supported by provision of a unique method of defining time slots.

Specifically, the invention utilizes commercially available universal time bases at each subscriber or termination section (where a directional coupler divides signals among a plurality (nominally four) of subscribers. These universal time bases are synchronized by a broadcast signal which does not require any use of the communication system, itself, to achieve such synchronization other than to reset time slot counters at the termination sections of the system (which can be done with a very brief signal at widely separated intervals). A similar universal time base is preferably used at the central station, as well but does not need to identify time slots with particular subscribers other than for error checking but only to define sampling intervals for the incoming signals (since the signals transmitted from the termination sections identify individual subscribers).

In operation in accordance with a preferred implementation of the invention, when a monitored condition is detected at a subscriber station, a latch 44 is set to enable transmission in an appropriate time slot. Comparators 45 monitor a time slot count from counter 24' which is responsive to the time base at the termination section. When the time slot count matches the time slot number allotted to a particular subscriber, a corresponding dialer 46 is enabled to provide a sequence of tones identifying the subscriber reporting the condition and, if desired and plural conditions are monitored, the nature of the condition. In a preferred implementation, as disclosed, such dialers are able to transmit at least ten tones per second with each tone corresponding to one of at least ten digits, # and \*. The synchronization of the time bases prevents the generation of tones from different subscribers from overlapping when transmitted from the respective termination sections or received by the central station even in a worst case scenario.

Thus, the invention provides for over one hundred thousand subscribers to be uniquely identified (or, more accurately, one of over one hundred thousand subscribers to uniquely identify itself) with five sequential digits or tones and provide two digits of condition information uniquely identifying one of over one hundred conditions or combinations of conditions using a time slot of only one second duration while leaving at least 200 milliseconds of that time slot to accommodate variations in signal propagation time over the system, which may be widely distributed geographically. When received by the central station, the tones need only be converted to a digital code that can be used by a desired output device such as a printer.

Thus, the principal distinguishing feature of the invention which underlies support of all the above-described advantages and meritorious effects of the invention is, as described beginning at page 10, line 20, of the specification, the use of time bases which can be synchronized with only extremely minimal use of the communication system. This feature is reflected in the original claims in the recitations of:

"means for coupling said sequence of tones to said communication path during a time slot determined by a time base" (claim 1)

and

"assigning a time slot of a plurality of sequential time slots to each terminal unit of a group of terminal units"

in combination with

"identifying a terminal unit in accordance with said sequence of tones at a central facility and synchronized with said time slots" (claim 18).

Both of these recitations clearly distinguish the invention from the arrangements of Ortel and Mori et

al. which require some telecommunications infrastructure to identify a subscriber location, the use of downstream signalling to individual subscribers (which cannot, as a matter of efficient bandwidth usage, be provided using a time slot unique and dedicated to each subscriber) and/or the absence of a signal received at a central station to signal detection of a fault. Moreover, these recitation have been augmented by indicating the location of a time base (which determines the time slots) as being at a termination section of the communication system in claim 1 and reciting that the time slots are independently but synchronously defined at both the termination section(s) and the central station, respectively, in claim 18. Therefore, the combination of Ortel and Mori et al. clearly do not answer the recitations of the claims as originally presented or now amended. This deficiency is not mitigated by the teachings of Cheng and the Examiner does not assert that Cheng is relevant to the invention in regard to such a synchronization arrangement but, rather, only assert that Cheng is relevant to alteration of polling frequency and resetting. However, Cheng appears to be principally concerned with asynchronous operation and channel allocation in a selective polling process which is contrary to the nature of the invention and for the purpose of accommodating collisions of overlapping polling in a controlled access scheme. Therefore, Cheng has essentially nothing to do with controlling polling frequency or time slot counter resetting in an environment of unique and exclusive time slot allocation to each subscriber. Therefore, Ortel, Mori et al. and/or Cheng taken alone or in any combination do not teach or suggest the claimed subject matter or provide evidence of a level of ordinary skill in the art which would support a conclusion of obviousness. On the contrary, all three references are directed to

On the contrary, all three references are directed to systems in which the efficiency of bandwidth utilization must be maximized through selective switching while the invention is highly counter-intuitive by using a time slot allocation unique to each subscriber which allows necessary information to be transmitted in a small number of digits in a short time slot in a separate and non-interfering channel on a single communication link while avoiding any additional downstream signalling on the communication link other than a brief and infrequent counter reset control signal; rendering bandwidth utilization efficiency substantially irrelevant. Therefore, it is abundantly clear that the grounds of rejection asserted by the Examiner are clearly in error and that the Examiner has not made and cannot make a *prima facie* demonstration of obviousness of any claim in the application based on the references relied upon. By the Same token, it is abundantly clear that the Examiner has not properly understood the claimed invention or considered all claim recitations or the claimed subject matter as a whole in asserting that the claims are unpatentable. Accordingly, reconsideration and withdrawal of the asserted grounds of rejection are respectfully requested.

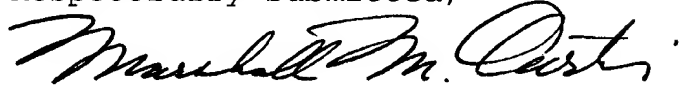
A sincere effort has been made, above, to convey an improved understanding of the invention as well as clarification of the claims to emphasize novel and distinguishing features thereof. Upon reconsideration, should the Examiner have any further questions or determine that this application is other than in condition for allowance, it is respectfully requested that the Examiner contact the undersigned by telephone at the number given below in order to expeditiously resolve any issue which might be seen to remain.

Since all rejections, objections and requirements contained in the outstanding official action have been

fully answered and shown to be in error and/or inapplicable to the present claims, it is respectfully submitted that reconsideration is now in order under the provisions of 37 C.F.R. §1.111(b) and such reconsideration is respectfully requested. Upon reconsideration, it is also respectfully submitted that this application is in condition for allowance and such action is therefore respectfully requested.

If an extension of time is required for this response to be considered as being timely filed, a conditional petition is hereby made for such extension of time. Please charge any deficiencies in fees and credit any overpayment of fees to Attorney's Deposit Account No. 50-2041.

Respectfully submitted,



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